

Online Supplement DS1

Additional results

Hardy–Weinberg equilibrium testing (HWE) P -values for the other 10 SNPs, with the exception of SNP rs10774037, were all larger than 0.05 in the healthy controls and all patients group (Tables DS2 and DS3). So rs10774037 was excluded from further analysis because it was not in Hardy–Weinberg equilibrium in controls (Tables DS2 and DS3).

Table DS6 presents the results of linkage disequilibrium (LD) of the 10 SNPs. The pairwise LD between 10 investigated SNPs was different in the different sample sets. SNPs with $D' > 0.95$ in two disorder sample sets were classified in the same block. No specific haplotype block was identified, as shown in Fig. DS2.

Tables DS4 and DS5 present the results for the 10 SNPs. For schizophrenia, we found that rs2239015, rs2283290, rs1006737 and rs2239037 were positively associated with schizophrenia (rs2239015: $P_{\text{allele}}=0.0003$, $P_{\text{genotype}}=0.0015$, OR=1.249 [95% CI 1.100–1.400]; rs2283290: $P_{\text{allele}}=0.039$, OR=1.181 [95% CI=1.008–1.384]; rs1006737: $P_{\text{allele}}=0.0014$, $P_{\text{genotype}}=0.006$, OR=1.384 [95% CI=1.134–1.690]; rs2239037: $P_{\text{allele}}=0.008$, $P_{\text{genotype}}=0.016$, OR=0.859 [95% CI=0.768–0.961]) (Table DS4). After Bonferroni multiple tests correction, rs2239015 and rs1006737 were still significant (rs2239015: $P_{\text{allele}}=0.006$, $P_{\text{genotype}}=0.030$; rs1006737: $P_{\text{allele}}=0.028$) (Table DS4).

Table DS1 The information of all 11 SNPs genotyped in the CACNA1C gene.

SNP ID	rs10774029	rs2239015	rs2239016	rs10848628	rs2283290	rs2238056	rs1006737	rs2239035	rs882194	rs2239037	rs10774037
Position	2280807	2283195	2283392	2312489	2323621	2327944	2345295	2349081	2350452	2363716	2420526
Functional	Intron3	Intron3	Intron3	Intron3	Intron3	Intron3	Intron3	Intron3	Intron3	Intron3	Intron3
Polymorphism	A/G	C/T	A/G	T/C	G/A	T/C	G/A	A/C	A/G	A/G	G/A

Table DS2 The call rate (%) and HWE test of 11 SNPs in schizophrenia patients and control.

SNP ID	rs10774029		rs2239015		rs2239016		rs10848628		rs2283290		rs2238056		rs1006737		rs2239035		rs882194		rs2239037		rs10774037 ^a	
	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control
call rate %	96.51	97.09	98.70	98.94	96.76	97.73	98.46	97.73	99.27	97.98	98.70	97.98	99.60	99.43	99.75	99.60	97.65	98.54	99.11	98.70	97.85	98.05
HWE P value	0.21	0.65	0.34	0.14	0.32	0.91	0.36	0.15	0.09	0.23	0.20	0.21	0.64	0.39	0.08	0.11	0.43	0.10	0.38	0.47	0.47	0.04

^a SNP rs10774037 was excluded from further analysis because it was not in Hardy–Weinberg equilibrium in controls.

Table DS3 The call rate (%) and HWE Pb of 11 SNPs in major depression patients and control

SNP ID	rs10774029		rs2239015		rs2239016		rs10848628		rs2283290		rs2238056		rs1006737		rs2239035		rs882194		rs2239037		rs10774037	
	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control	Case	Control
call rate %	98.28	97.09	98.18	98.94	98.56	97.73	99.14	97.73	99.23	97.98	97.99	97.98	98.95	99.43	97.89	99.60	98.28	98.54	97.89	98.70	97.85	98.05
HWE Pb	0.13	0.65	0.64	0.18	0.45	0.91	0.10	0.15	0.22	0.23	0.41	0.21	0.76	0.39	0.34	0.11	0.14	0.10	0.88	0.47	0.47	0.04

Table DS4 Allele and genotype frequency of the ten SNPs in schizophrenia. Bold numbers represent P-values < 0.05.

SNP ID	Alleles		OR[95%CI]	P-value	P-Bonferroni	Genotypes			P-value	P-Bonferroni
rs10774029	A(freq)	G(freq)				A/A(freq)	A/G(freq)	G/G(freq)		
Case	1101(0.462)	1283(0.538)	1.069[0.954~1.198]	0.253		265(0.222)	571(0.479)	356(0.299)	0.255	
Control	1068(0.445)	1330(0.555)				234(0.195)	600(0.500)	365(0.304)		
rs2239015	C(freq)	T(freq)				C/C(freq)	C/T(freq)	T/T(freq)		
Case	865(0.355)	1573(0.645)	1.249[1.100~1.400]	0.0003	0.006	161(0.132)	543(0.445)	515(0.422)	0.0015	0.030
Control	747(0.306)	1697(0.694)				125(0.102)	497(0.407)	600(0.491)		
rs2239016	A(freq)	G(freq)				A/A(freq)	A/G(freq)	G/G(freq)		
Case	1160(0.485)	1230(0.515)	1.043[1.109~1.410]	0.461		273(0.228)	614(0.514)	308(0.258)	0.561	
Control	1146(0.475)	1268(0.525)				273(0.226)	600(0.497)	334(0.277)		
rs10848628	C(freq)	T(freq)				C/C(freq)	C/T(freq)	T/T(freq)		
Case	924(0.380)	1508(0.620)	1.123[0.999~1.263]	0.051		168(0.138)	588(0.484)	460(0.378)	0.130	
Control	852(0.353)	1562(0.647)				139(0.115)	574(0.476)	494(0.409)		
rs2283290	A(freq)	G(freq)				A/A(freq)	A/G(freq)	G/G(freq)		
Case	390(0.159)	2062(0.841)	1.181[1.008~1.384]	0.039	0.780	39(0.032)	312(0.254)	875(0.714)	0.1266	
Control	334(0.138)	2086(0.862)				28(0.023)	278(0.230)	904(0.747)		
rs2238056	C(freq)	T(freq)				C/C(freq)	C/T(freq)	T/T(freq)		
Case	992(0.407)	1446(0.593)	1.111[0.990~1.246]	0.074		191(0.157)	610(0.500)	418(0.343)	0.191	
Control	924(0.382)	1496(0.618)				166(0.137)	592(0.489)	452(0.374)		
rs1006737	A(freq)	G(freq)				A/A(freq)	A/G(freq)	G/G(freq)		
Case	248(0.101)	2212(0.899)	1.384[1.134~1.690]	0.0014	0.028	14(0.011)	220(0.179)	996(0.810)	0.006	0.120
Control	184(0.075)	2272(0.925)				9(0.007)	166(0.135)	1053(0.857)		
rs2239035	A(freq)	C(freq)				A/A(freq)	A/C(freq)	C/C(freq)		
Case	1618(0.657)	846(0.343)	0.981[0.872~1.104]	0.749		545(0.442)	528(0.429)	159(0.129)	0.949	
Control	1626(0.661)	834(0.339)				550(0.447)	526(0.428)	154(0.125)		
rs882194	A(freq)	G(freq)				A/A(freq)	A/G(freq)	G/G(freq)		
Case	1388(0.575)	1024(0.425)	0.904[0.807~1.014]	0.085		406(0.337)	576(0.478)	224(0.186)	0.050	0.100
Control	1460(0.600)	974(0.400)				424(0.348)	612(0.503)	181(0.149)		
rs2239037	A(freq)	G(freq)				A/A(freq)	A/G(freq)	G/G(freq)		
Case	1142(0.467)	1306(0.533)	0.859[0.768~0.961]	0.008	0.160	274(0.224)	594(0.485)	356(0.291)	0.016	0.320
Control	1230(0.505)	1208(0.495)				304(0.249)	622(0.510)	293(0.240)		

Table DS5 Allele and genotype frequency of the ten SNPs in major depressive disorder. Bold numbers represent P-values < 0.05.

SNP ID	Alleles		OR[95% CI]	P-value	P-Bonferroni	Genotypes			P-value	P-Bonferroni
rs10774029	A(freq)	G(freq)				A/A(freq)	A/G(freq)	G/G(freq)		
Case	904(0.440)	1150(0.560)	0.979[0.869~1.102]	0.725		187(0.182)	530(0.516)	310(0.302)	0.677	
Control	1068(0.445)	1330(0.555)				234(0.195)	600(0.500)	365(0.304)		
rs2239015	C(freq)	T(freq)				C/C(freq)	C/T(freq)	T/T(freq)		
Case	680(0.331)	1372(0.669)	1.114[0.982~1.263]	0.0931		116(0.113)	448(0.437)	462(0.450)	0.214	
Control	747(0.308)	1679(0.692)				125(0.103)	497(0.410)	591(0.487)		
rs2239016	A(freq)	G(freq)				A/A(freq)	A/G(freq)	G/G(freq)		
Case	1019(0.495)	1041(0.505)	1.083[0.963~1.218]	0.1836		246(0.239)	527(0.512)	257(0.250)	0.337	
Control	1146(0.475)	1268(0.525)				273(0.226)	600(0.497)	334(0.277)		
rs10848628	C(freq)	T(freq)				C/C(freq)	C/T(freq)	T/T(freq)		
Case	702(0.339)	1370(0.661)	0.9394[0.830~1.063]	0.3211		107(0.103)	488(0.471)	441(0.426)	0.577	
Control	852(0.353)	1562(0.647)				139(0.115)	574(0.476)	494(0.409)		
rs2283290	A(freq)	G(freq)				A/A(freq)	A/G(freq)	G/G(freq)		
Case	283(0.136)	1791(0.864)	0.987[0.832~1.170]	0.879		24(0.023)	235(0.227)	778(0.750)	0.984	
Control	334(0.138)	2086(0.862)				28(0.023)	278(0.230)	904(0.747)		
rs2238056	C(freq)	T(freq)				C/C(freq)	C/T(freq)	T/T(freq)		
Case	795(0.388)	1253(0.612)	1.027[0.910~1.159]	0.663		148(0.145)	499(0.487)	377(0.368)	0.878	
Control	924(0.382)	1496(0.618)				166(0.137)	592(0.489)	452(0.374)		
rs1006737	A(freq)	G(freq)				A/A(freq)	A/G(freq)	G/G(freq)		
Case	214(0.103)	1854(0.897)	1.425[1.160~1.752]	0.0007	0.014	12(0.012)	190(0.184)	832(0.805)	0.003	0.060
Control	184(0.075)	2272(0.925)				9(0.007)	166(0.135)	1053(0.857)		
rs2239035	A(freq)	C(freq)				A/A(freq)	A/C(freq)	C/C(freq)		
Case	1311(0.641)	735(0.359)	0.915[0.809~1.035]	0.156		413(0.404)	485(0.474)	125(0.122)	0.075	
Control	1626(0.661)	834(0.339)				550(0.447)	526(0.428)	154(0.125)		
rs882194	A(freq)	G(freq)				A/A(freq)	A/G(freq)	G/G(freq)		
Case	1198(0.583)	856(0.417)	0.934[0.829~1.052]	0.260		338(0.329)	522(0.508)	167(0.163)	0.513	
Control	1460(0.600)	974(0.400)				424(0.348)	612(0.503)	181(0.149)		
rs2239037	A(freq)	G(freq)				A/A(freq)	A/G(freq)	G/G(freq)		
Case	1031(0.504)	1015(0.496)	0.998[0.887~1.122]	0.968		261(0.255)	509(0.498)	253(0.247)	0.835	
Control	1230(0.505)	1208(0.495)				304(0.249)	622(0.510)	293(0.240)		

Table DS6a. LD data of 10 SNPs in the samples of schizophrenia. D' and r^2 shows in the upper and under portion of the table, respectively.

	rs10774029	rs2239015	rs2239016	rs10848628	rs2283290	rs2238056	rs1006737	rs2239035	rs882194	rs2239037
rs10774029	-	0.444	0.025	0.408	0.276	0.342	0.205	0.198	0.292	0.124
rs2239015	0.118	-	0.781	0.303	0.017	0.247	0.067	0.255	0.253	0.211
rs2239016	0.001	0.328	-	0.15	0.006	0.199	0.192	0.141	0.188	0.169
rs10848628	0.079	0.026	0.012	-	0.537	0.863	0.351	0.421	0.781	0.687
rs2283290	0.016	0	0	0.029	-	0.489	0.66	0.595	0.436	0.426
rs2238056	0.063	0.02	0.024	0.659	0.027	-	0.155	0.408	0.742	0.701
rs1006737	0.003	0.001	0.004	0.02	0.007	0.003	-	0.244	0.264	0.284
rs2239035	0.017	0.017	0.01	0.16	0.032	0.133	0.003	-	0.529	0.373
rs882194	0.05	0.022	0.023	0.501	0.023	0.511	0.009	0.206	-	0.731
rs2239037	0.013	0.024	0.028	0.255	0.03	0.299	0.007	0.068	0.352	-

Table DS6b. LD data of 10 SNPs in the samples of major depressive disorder . D' and r² shows in the upper and under portion of the table, respectively.

	rs10774029	rs2239015	rs2239016	rs10848628	rs2283290	rs2238056	rs1006737	rs2239035	rs882194	rs2239037
rs10774029	-	0.442	0.047	0.532	0.235	0.49	0.255	0.16	0.346	0.199
rs2239015	0.114	-	0.893	0.375	0.035	0.327	0.058	0.18	0.331	0.315
rs2239016	0.002	0.397	-	0.139	0	0.174	0.076	0.083	0.149	0.154
rs10848628	0.119	0.035	0.009	-	0.524	0.957	0.224	0.388	0.818	0.736
rs2283290	0.011	0	0	0.023	-	0.561	0.101	0.562	0.384	0.459
rs2238056	0.12	0.031	0.018	0.773	0.031	-	0.166	0.382	0.765	0.738
rs1006737	0.005	0.001	0.001	0.009	0	0.004	-	0.341	0.258	0.214
rs2239035	0.011	0.008	0.003	0.149	0.027	0.126	0.006	-	0.421	0.327
rs882194	0.065	0.035	0.014	0.515	0.016	0.532	0.009	0.138	-	0.7
rs2239037	0.031	0.045	0.022	0.289	0.034	0.344	0.004	0.058	0.342	-

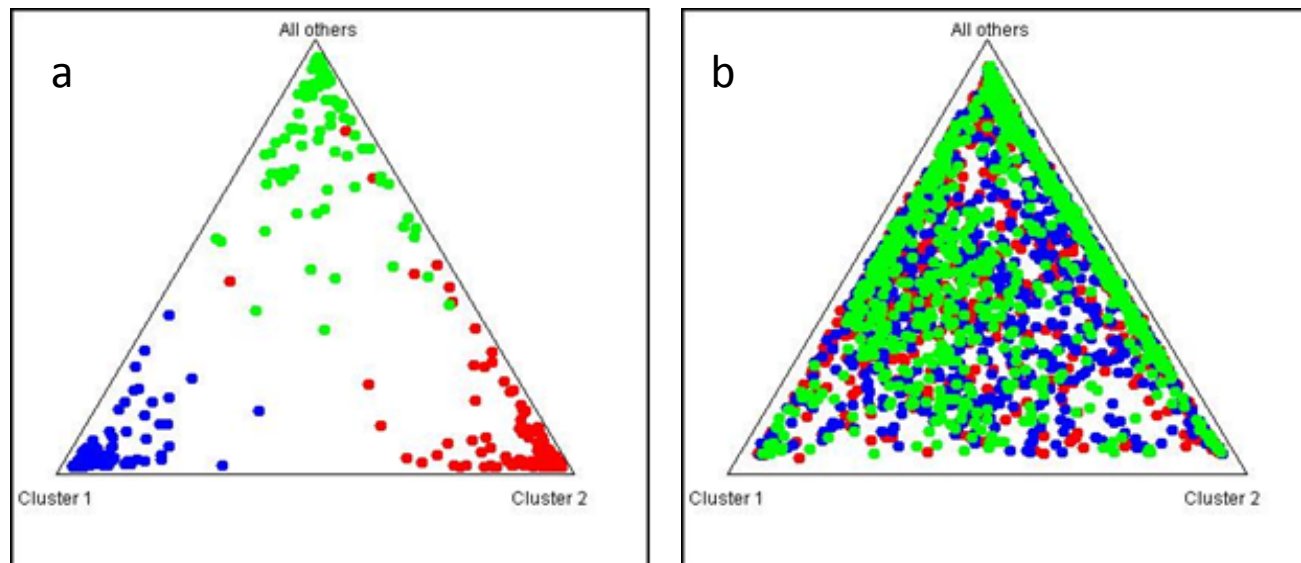
Table DS6c. LD data of 10 SNPs of CHB+JPT from HapMap. D' and r² shows in the upper and under portion of the table, respectively.

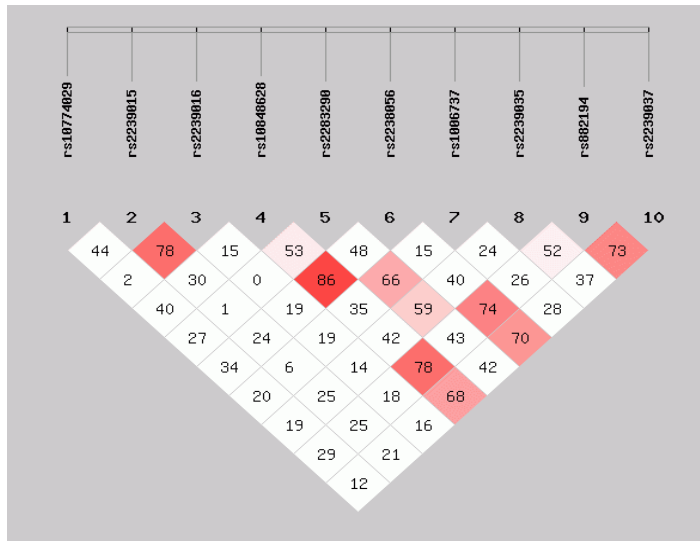
	rs10774029	rs2239015	rs2239016	rs10848628	rs2283290	rs2238056	rs1006737	rs2239035	rs882194	rs2239037
rs10774029	-	0.373	0.075	0.511	0.214	0.533	0.799	0.445	0.478	0.275
rs2239015	0.073	-	1	0.169	0.38	0.206	0.056	0.304	0.182	0.273
rs2239016	0.003	0.414	-	0.003	0.241	0.016	0.124	0.03	0.051	0.089
rs10848628	0.09	0.005	0	-	1	0.975	0.881	0.901	0.845	0.625
rs2283290	0.017	0.01	0.01	0.124	-	1	1	0.884	0.909	0.758
rs2238056	0.105	0.008	0	0.885	0.133	-	0.877	0.932	0.867	0.672
rs1006737	0.031	0	0.001	0.109	0.017	0.101	-	1	1	0.846
rs2239035	0.043	0.011	0	0.52	0.062	0.518	0.028	-	0.936	0.702
rs882194	0.071	0.005	0.001	0.647	0.093	0.634	0.156	0.619	-	0.7
rs2239037	0.047	0.024	0.006	0.216	0.129	0.267	0.056	0.174	0.245	-

Fig. DS1 The triangle charts of population-stratification analysis when $K=3$.

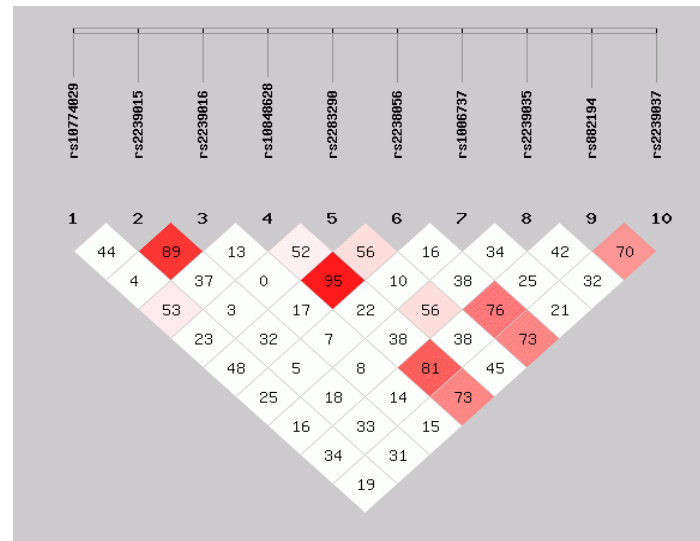
a, stratification result of combined population, in which the red, green and blue dots represent HapMap CEU, CHB and YRI population, respectively.

b, our samples from the two disorders and controls, in which the blue dots represent SCZ, the green dots represent MDD and the red dots represent healthy control populations.





a schizophrenia



b major depressive disorder

Fig. DS2 LD plots of schizophrenia and major depressive disorder.

a, b are the LD plots from SHEsis platform of schizophrenia and major depressive disorder, respectively.